



## -SHORT COMMUNICATION-

### Occurrence of the Spotted Sea Hare *Aplysia dactylomela* (Rang 1828, Aplysiidae) in the Yeşilovacık Bay, Northeastern Mediterranean Coast of Turkey

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#### Abstract

The alien opisthobranch, *Aplysia dactylomela*, is recorded for the first time from the Yeşilovacık Bay in 2017. One specimen of *A. dactylomela* was photographed at the infralittoral zone of the Bay. The length of the specimen was 35 cm. The individual was photographed while feeding on rocks covered with algae. The first record of the *A. dactylomela* from the Mediterranean Sea was reported from the island of Lampedusa (Central Mediterranean Sea) was reported in 2002. In the following years, *A. dactylomela* was reported from the North-Eastern Sicily, from the coast of Hatay (NE Mediterranean Sea of the Turkey), from the island of Crete (Aegean Sea), from the coast of Kaş (NE Mediterranean Sea of the Turkey), from the Cirkewwa (Malta), from the Akhziv submarine canyon (Israel), from the island of Paros (Aegean Sea), from the island of Susac (Croatia), from the Montenegro (SE Adriatic Sea), from the Egadi Islands marine protected area (western Sicily), from the Capo San Donato harbour (Ligurian Sea).

#### Keywords:

Spotted Sea Hare, *Aplysia dactylomela*, Yeşilovacık Bay, NE Mediterranean Sea

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## Introduction

Sea hares are almost shell-free marine Opisthobranchs because they do not have an outer protective shell, but only a small, degenerate and inner shell (Derby, 2007; Kamiya et al., 2006), and also they use a chemical mixture for defense and communication (Kicklighter et al., 2005).

*A. dactylomela* is a sea hare, belonging to the order Opisthobranchia, subclass Gastropoda. *A. dactylomela*, a spotted sea hare, up to 40 cm long, with body shades of green, brown, and cream. Its mantle has shapes of black rings with cream spots which are connected by a network of black lines. Mantle usually has large black rings. It is sheltered eulittoral and shallow sublittoral (Worms, 2017).

*A. dactylomela* distributes worldwide in tropical to warm temperate waters (Vairappan et al., 2007; Ioannou et al., 2009). It is usually found in sea grass beds where it feeds (Barnes, 1963). *A. dactylomela* feeds on red and green algae. It uses its jaws to grasp the algae and its radula to pull the algae into its buccal cavity. The crop in *A. dactylomela* is lined with chitinous plates and acts like a gizzard to aid in the digestion of the larger seaweeds that it eats. Foods eaten; *Chondrococcus hornemanni*, *Ulva reticulata*, *Laurencia spp.*, *Martensia fragilis* and *Spyridia filamentosa* (MacFarland, 1909; Wilbur & Yonge, 1966). It is thought that *A. dactylomela* consumes algae and produces secondary metabolites from algae and stores these metabolites in its digestive glands and uses them as a defense mechanism against predators (McPhail et al., 1999).

When feeling threatened *A. dactylomela* will elicit a quick downward movement of its parapodia over its back. It may also release foul fluids from both the opaline gland and the purple dye cavity. Purple color (aplysiocyanin) of the secretion is derived from pigments (phytoerythrin) found in the red algae (Rüdiger, 1967; Chapman and Fox, 1969; MacColl et al., 1990). The idea that *A. dactylomela* releases ink and opaline in defensive situations is widely held (Barnes, 1963; Tobach, et al., 1989; Wilbur & Yonge, 1966). The most peculiar feature of these invertebrates is their secretion, which is rich in bioactive proteins. Many of these proteins belong to a family of L-amino acid oxidases (L-AAOs) (Tallita et al., 2011). A chemically defended animal not only avoids being eaten by using its chemical arsenal, but it also avoids predators by detecting chemicals released by attacked conspecifics and subsequently producing evasive behaviors. These conspecific chemicals, called alarm signals, are known from many species (Blum, 1996; Wisenden, 2000; Wyatt, 2003).

In this study, the specimen of the *A. dactylomela* was photographed in a rock pool which covered with algae during feeding and also its size was measured.

One specimen of *A. dactylomela* was photographed at the infralittoral zone of the Bay (36°07'32.5"N 33°36'31.6"E) on 26 March, 2017, at a depth of 1 m in a rock pool together with *Padina pavonica* (Linnaeus) and other algae (Figure 1).

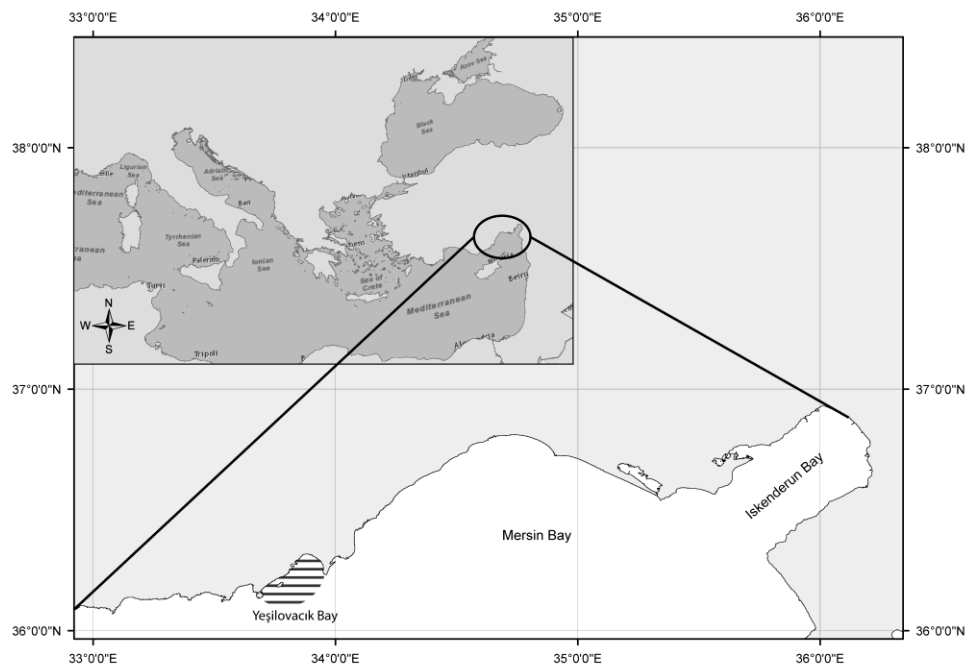


Figure 1. The shaded area indicates the location where the specimen was observed

A specimen of spotted sea hare was seen in a rock pool which was covered with algae. It was first recorded from Yeşilovacık Bay in 2017 (Figure 2). The specimen of *A. dactylomela* were sighted in a rock pool at about 1 m deep and its length is 35 cm in the rock pool was covered with algae species. It was sighted the *Padina pavonica* from the brown algae in the rock pools.



Figure 2. *Aplysia dactylomela* from Yeşilovacık Bay (35 cm length).

## Discussion

The first record of the *A. dactylomela* from the Mediterranean Sea, in the Strait of Sicily waters was reported in 2002 (Trainito, 2003). Some reports of the *A. dactylomela* are given in the Mediterranean Sea in Table 1.

Table 1. *Aplysia dactylomela* reported in the Mediterranean Sea

	Total (cm)	Length	Sample Number	Location
<b>Present Study, 2017</b>	35		1	Yeşilovacık Bay, North-Eastern Mediterranean
<b>Bernat &amp; Molinari, 2016</b>	20		1	Capo San Donato harbour, Ligurian Sea
<b>Mannino et.al., 2014</b>	6 to 35		21	Egadi Islands marine protected area (western Sicily)
<b>Yokes et al., 2012</b>	14.5		1	Kaş Coast, north- eastern Mediterranean
<b>Kljajić &amp; Mačić, 2012</b>	15, 17		2	Montenegro (SE Adriatic Sea)
<b>Turk &amp; Furlan, 2011</b>	-		1	The island of Susac (Crotia) Adriatic Sea
<b>Katsanevakis, 2011</b>	-		3	The island of Paros, Aegean Sea
<b>Pasternak &amp; Galil, 2010</b>	12, 20		2	Akhziv submarine canyon (Israel)
<b>Schembri, 2008</b>	30		1	Cirkewwa, Malta, Kaş Coast,
<b>Yokeş et al., 2010</b>	-		14	north-eastern Mediterranean
<b>Poursanidis et al., 2009</b>	-		1	The island of Crete Agean Sea
<b>Çınar et al., 2006</b>	18		1	Hatay Coast, north-eastern Mediterranean
<b>Greco, 2006</b>	-		30	North-Eastern Sicily (Giardini Naxos, Taormina)
<b>Trainito, 2003</b>	-		1	The island of Lampedusa, Central Mediterranean Sea

The first record of the species in Turkish coastal waters was noted in Hatay (Çınar et al. 2006). The last record of the species was reported in 2012 in Kaş, Turkey (Yokes et al., 2012). The present short communication reported the first record of *A. dactylomela* from Yeşilovacık Bay.

It is common in the tropical Indian and Pacific Oceans and it is also quite well distributed in the Caribbean and in Atlantic Islands along the west coast of Africa. Although this is quite a common sea hare, how and where they came from to the Mediterranean is still unknown (Schembri, 2008).

In a study by Bernat & Molinari (2016), the specimen of the *A. dactylomela* were on the rocky plateau surface, well colonized by photophilic algae represented mainly by Chlorophyceae (especially *Acetabularia acetabulum*, *Ulva* sp. and *Flabellia petiolata*), Rodophyceae as *Jania rubens* and Phaeophyceae as *Padina pavonica*. Similarly, in our study, we observed a specimen on

the rock pool covered with algae. There were also the specimen of *Padina pavonica* from Phaeophyceae with it. Thus, it can be said that this species inhabits rocky areas abundant with macro algae.

Spotted sea hare has the ability to transform secondary metabolites from algae into powerful chemicals. It also has the ability to protect itself against predators due to the efficient chemical defense. It might accelerate the establishment and expansion of this big sea hare species.

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